Operational Impact of the QPF Component of the 2011 Spring Experiment

Faye E. Barthold[1,2], David R. Novak[1], Michael J. Bodner[1], Steven J. Weiss[3], and Tara L. Jensen[4]

[1]NOAA/NWS/NCEP/Hydrometeorological Prediction Center
[2]I.M. Systems Group, Inc.
[3]NOAA/NWS/NCEP/Storm Prediction Center
[4]NCAR/Research Applications Laboratory

Flooding is one of the leading causes of weather-related deaths in the United States, with a majority of those deaths occurring between May and September. Despite incremental improvements over the past several decades, warm season rainfall remains a critical forecast challenge. To help address this challenge, the Hydrometeorology Testbed at the Hydrometeorological Prediction Center (HMT-HPC) led the quantitative precipitation forecasting (QPF) component of the 2011 NOAA Hazardous Weather Testbed (HWT) Spring Experiment. The purpose of the QPF component was to bring researchers and operational forecasters together to explore the use of new forecasting techniques and emerging model guidance for improving forecasts of heavy precipitation associated with warm season convection. This work will provide an overview of the QPF component of the Spring Experiment with a particular focus on the impact of the experiment on HPC operations.

The Spring Experiment featured a variety of high resolution convection-allowing deterministic and ensemble model guidance from partners including the National Severe Storms Laboratory (NSSL), NCEP's Environmental Modeling Center (EMC), and the University of Oklahoma's Center for Analysis and Prediction of Storms (CAPS). In addition to the experimental model guidance, new forecast tools and visualizations were also available. QPF component participants used this experimental guidance to forecast the probability of exceeding 0.5 in and 1.0 in of precipitation during three near term 6 hour periods. Participants were also asked to subjectively evaluate the performance of the experimental models relative to their operational counterparts, and the Developmental Testbed Center (DTC) provided corresponding objective verification results.

The QPF component of the Spring Experiment demonstrated that high resolution models and ensembles can provide useful forecast guidance. As a result, HPC forecasters are increasingly incorporating this information into their forecasts. The QPF component also demonstrated that visualizations such as spaghetti plots can be used to help condense information from multiple deterministic high resolution models into a single easy-to-use display. As the number of datasets continues to expand, developing efficient visualizations is necessary to prevent forecasters from becoming increasingly overwhelmed with data. Finally, the 2011 Spring Experiment revealed that a small-membership "poor man's" ensemble of readily available high resolution models can provide valuable QPF guidance. While convection-allowing ensembles have been available for research purposes for several years, this finding is significant because a "poor man's" ensemble can be run in real time today at an operational center.